

FREIBERGER, R.

FREIBERGER, R. Methods for determining the economic effectiveness of results  
of research work. p. 61.

Vol. 5, No. 11, Nov. 1955  
ZA SOCIALISTICKOU VEDU A TECHNIKU  
TECHNOLOGY  
Praha, Czechoslovakia

So: East European Accession, Vol. 5, No. 5, May 1956

FREIBERHER, R.

Fuel and power consumption in Czechoslovakia. p. 402

TECHNICKA PRACA. Bratislava, Czechoslovakia, Vol. 7, No. 9, Sept. 1955

Monthly List of East European Accessions (EEAI), LC. Vol. 8, No. 9, September 1959  
Uncl.

FREIBERGER, R. - Paliva - Vol. 35, no. 2, Feb. 1955.

Technical and organizational measures as justification for standards of fuel and power consumption. p. 33.

SO: Monthly list of East European Accessions, (EEAL), LC, Vol. 4, No. 9, Sept. 1955  
Uncl.

FREIBERGER, R.

FREIBERGER, R. The future development of Siberia and her power resources.  
p. 540, Vol 4, no. 5, 1956 SOVETSKA VEDA: ENERGETIKA  
Praha, Czechoslovakia

SOURCE: East European Accessions List (EEAL) Vol. 6, No. 4, April 1957

FREIBERGER, R.

FREIBERGER, R. Importance of water power resources in the USSR. p. 621,  
Vol. 4, no. 6, 1956. SOVETSKA VEDA: ENERGETIKA  
Praha, Czechoslovakia

SOURCE: EAST EUROPEAN ACCESSIONS LIST (EEAL) VOL 6 NO 4 APRIL 1957

FREIBERGER, R., dr., inz.

Some general features of the balance method, and their application on thermal balances. Paliva 42 no.6:186-188 Je '62.

1. Energeticky ustav, Praha.

FREIBERGER, R., dr., inz.

Rationalization of power consumption from the viewpoint of  
technical development and power resources. Energetika Cz 11  
no.12:633-637 D '61.

PEREDY, Sandor; MONATH, Lajos; RAPELIUS, Karl (Leipzig); CALLENBERG, Waldemar (Leipzig); LIPKA, Ceslav (Praha); FREIBERGER, Rudolf, dr. ing. (Praha); SCHENKEL, Gerhard, dr. ing. (Karlsruhe); MIKULSKI, Jan, dr. ing. (Katowice); FRATZSCHER, Wolfgang, dr. ing. (Drezda); BENEDEK, Istvan; CUKOR, Gyorgy; SAGI, Marton; SOVARY, Emil; NAGY, Csaba (Roman Nepkoztarsasag); ELEFTERESCU, M. (Roman Nepkoztarsasag); KOVACS, Istvan (Roman Nepkoztarsasag); LAZAR, Peter, dr.; MEJRO, Cz., prof. (Varso); KOKOVAY, Janos, dr.; SCHAEFER, Helmuth, dr. ing. (Karlsruhe); BORBAS, Nandor; GRUHN, Gunther, Dipl. ing. (Drezda); SZABO, Bendeguz; GYORI, Attila; MOLNAR, Laszlo; RECZEY, Gusztav, dr.

Determination and application of specific power utilization indexes. Ipari energia 3 no.1/2:15-22 Jg-F '62.

1. Koho- es Gepipari Miniszterium Ipargazdasagi es Uzemszervezesi Intezete (for Peredy).
2. Obudai Hajogyar (for Monath).
3. Orszagos Energiagazdalkodasi Hatosag (for Benedek and Reczey).
4. Magyar Tudomanyos Akademia Kozgazdasagtudomanyi Intezete (for Cukor and Sagi).
5. Eromu Tervezo Iroda (for Sovary).
6. Konnyuipari Miniszterium (for Kokovay).
7. Voros Csillag Traktorgyar (for Borbas).
8. Kobanyai Muanyaggyar (for Szabo).
9. Koho- es Gepipari Miniszterium Energiaosztaly (for Molnar).



FREIBERGER, Rudolf, dr. inz.

Optimum selection of power systems and carriers for  
industrial technology purposes. Energetika Cz 15 no.1:  
9-13 Ja '65.

1. Research Institute of Power Engineering, Prague.

FREIBERGS, L.; EGLE, A., red.; ČAKSS, J., tekhn. red.

[Latvian blackhead sheep are good meat producers] Latvijas  
tumsgalvu aitas - labas gaļas razotajas. Riga, Latvijas  
Valsts izdevnieciba, 1961. 37 p. (MIRA 15:3)  
(Latvia--Sheep breeds)

FREIBERGS, L.

[Cultivated perennial pastures for sheep] Kultivetas ilg-  
gadigas ganības aitam. Rīga, Latvijas lopkopības un ve-  
terinārijas zinātniski pētnieciskais institūts, 1961. 24 p.  
(MIRA 15:10)

(Latvia---Pastures and meadows)  
(Latvia---Sheep)

FREIDE, N.

Ivanov, G. Improvement of rationalizers in surveying coal deposits. p. 86.  
MINNO DELO, Sofiya, Vol. 10, no. 1, Jan./Feb. 1955.

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, no. 10, Oct. 1955,  
Uncl.

KULL,E; FREIDIN,P., red.; LAUL, Ü., tekhn. red.

[Planning in industrial enterprises] Planeerimine tööstusettevõtetes. Tallinn, Eesti Riiklik Kirjastus, 1962. 335 p.  
(MIRA 16:12)  
(Industrial management)

FREIDLINA, P.H. [Freydlina, P. Kh.]; KOST, V.N.; HORLINA, M.I. [Khorlina, M.Ya.]

Rearrangement of radicals in solutions. Analele chimie 17 no.3:131-174 J1-S '62.

RUMANIA / Chemical Technology. Chemical Products and H  
Their Application. Fats and Oils. Waxes. Soap-  
sand Detergents. Flotation Agents.

Abs Jour: Ref Zhur-Khimiya, No 12, 1959, 43841.

Author : Freier B., Constantinescu F.

Inst : Not given.

Title : Hydrogenation of the Extracted Sunflower Oil in  
the Hydrogenation Plant Provided with the Circu-  
lation of Oil in Hydrogen.

Orig Pub: Lucrarile Inst. cercetari aliment., 1958, 2, 91-97.

Abstract: Hydrogenation (H) of sunflower oil, that was ob-  
tained by extraction with benzene, when conducted  
in installations of the Vil'bushevich type, pre-  
sents considerable difficulties. For the purpose  
of developing optimum conditions for H, oil samples  
of different degree of refining were subjected to

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RUMANIA / Chemical Technology. Chemical Products and H  
Their Application. Fats and Oils. Waxes. Soap-  
sand Detergents. Flotation Agents.  
APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000413620002-3  
Abs Jour: Ref Zhur-Khimiya, No 12, 1959, 43841.

Abstract: H. Conditions for oil refining and for H were in-  
vestigated. It was established that a highly re-  
fined oil (up to the bleaching operation) should  
be employed for H. The refining of oil prior to  
H should include treatment with charcoal to be used  
in the quantity of 0.7% basis the weight of oil at  
150° and in the atmosphere of H<sub>2</sub>. This shortens  
time required for H and produces better results.  
Presented are tables that depict the effect of the  
degree of refining and of treatment with charcoal  
on the H process. -- V. Kraseva.

Card 2/2

FREIMAN, K.

A contribution to the presence of hypernephroma in the paranasal sinuses. Cesk. otolar. 10 no.6:362-366 D '61.

1. Otorinolaryngologicka klinika hyg. fakulty KU v Praze 12, predn. prof. dr. Vl. Hlavacek.

(PARANASAL SINUSES neoplasms)  
(ADENOCARCINOMA case reports)



FREIFELD, Herman, ing.

Considerations on the car technical maintenance system  
applied in Rumania. Rev transport ll no.10:433-439 0 '64.

FREIMAN, L.I.; TITOV, V.A. (Moscow)

Diffusion of electrolytic hydrogen through iron plates, and the  
mechanism of hydrogen overvoltage on iron. Zhur.fiz.khim. 34  
no.1:23-26 Jan '60. (MIRA 13:5)  
(Hydrogen) (Overvoltage) (Iron)

FREIMANE, Z.

Changes.

p. 12 (Padomju Latvijas Kolchoznieks. Vol. 9, no. 10, Oct. 1957, Riga, Latvia)

Monthly Index of East European Accessions (MIE)LC. Vol. 7, no. 2,  
February 1958

FREIMANN, K.; SKOKAN, Z.V.

Retropharyngeal abscess with subluxation of the 2d cervical vertebra.  
Cesk. otolaryng. 11 no.2:115-118 Ap '62.

1. Otorinolaryngologicka klinika, prednosta prof. dr. Vl. Hlavacek,  
DrSc., a rentgenologicke oddeleni fakultni nemocnice v Praze 10,  
prednosta prof. dr. R. Blaha.  
    (PHARYNX diseases) (SPINE fract & disloc)  
    (ABSCESS case reports)

FREINDL, L.; NIEWODNICZANSKI, H.; NURZYNSKI, J.; SLAPA, M.; STRZALKOWSKI, A.

Elastic scattering of 12.8 MeV deuterons on some light nuclei.  
Acta physica Pol 23 no.5:619-628 My '63.

1. Institute of Nuclear Physics, Krakow.

FREINDL, L.; NIEWODNICZANSKI, H.; MURZYNSKI, J.; SLAPA, M.; STRZALKOWSKI, A.

Elastic scattering of 12.8 MeV deuterons on some light nuclei.  
Inst fiz jadr report no.203:1-19 '62.

1. Institut Fizyki Jadrowej, Krakow.

L 09211-67

ACC NRI AP7002755

SOURCE CODE: PO/0046/66/011/005/0359/0367

AUTHOR: Chwaszczewska, Janina--Khvashchevskaya, Ya.; Freindl, Ludwik--Frendl', L.;  
Karcz, Waldemar--Karch, V.; Przyborski, Wincenty--Priborski, V.; Slapa, Mieczyslaw

ORG: [Chwaszczewska; Przyborski] Institute of Nuclear Research, Swierk; [Freindl]  
Institute of Nuclear Physics, Krakow; [Karcz] Institute of Physics, Jagellonian  
University, Krakow; [Slapa] Central Laboratory for Radiological Protection, Warsaw

TITLE: Semiconductor system for charged particles identification

SOURCE: Nukleonika, v. 11, no. 5, 1966, 359-367

• TOPIC TAGS: particle counter, radiation counter

ABSTRACT: A system consisting of two semiconductor counters of types dE/dx and E was built to separate particles from nuclear reactions. The properties of this system were checked by detection of products of reactions induced by 24.8 Mev alpha particles and 12.4 Mev deuterons on Au, C, and Ca nuclei. The authors thank Professor H. Niewodniczanski and Professor B. Buras for their interest in this work. The authors also thank Doctor K. Grotowski, Doctor A. Strzalkowski and Doctor A. Budzanowski for their advice and encouragement throughout the progress of this work. They give special thanks to Cyclotron Operation Staff for running the machine. Orig. art. has: 13 figures. [Orig. art. in Eng.] [NA]

SUB CODE: 18 / SUBM DATE: 09Dec65 / ORIG REF: 003 / OTH REF: 004

Card 1/1 *YN*

*0925 1629*

CZECHOSLOVAKIA

FREIOVA, E.; [Affiliation not given].

"Alcoholism of Parents and Moral Impairment of Youngsters of School Age."

Prague, Ceskoslovenska Psychiatrie, Vol 62, No 3, Jun 66, pp 188 - 192

Abstract [Author's English summary modified]: 516 families were investigated as a result of moral impairment found in a child of these families. The children were 9 to 16 years old. Alcoholism of one or both parents was found in 138 families, that is 26.7%. In 47 cases more than one child from the same family was found to be morally impaired. Out of these families 53.2% were alcoholics and each family had at least 3 children, the average being 3.92. Alcoholism usually reduced the educational level of the children. 9 Czech references. (Manuscript received 29 Apr 64).

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FREIOVA, Eliska

Combination of therapeutic and educational processes in children with psychopathic traits. Cesk. psychiat. 58 no.3:179-182 Je '62.

1. Detsky domov, Praha-Krc.

(PSYCHOPATHIC PERSONALITY)

FREISINGER, F.

LAPIS, K., BALO, J., FREISINGER, F.

Apoplexy and gastric ulcer. Orv. hetil. 91:26, 25 June 50.  
p. 805-5

1. First Pathological Anatomy and Experimental Cancer Research  
Institute (Head--Dr. Jozsef Baló), Budapest University.

CML 19, 5, Nov., 1950

F. FREISINGER, J. LORINC

—APPROVED FOR RELEASE: 06/13/2000

CIA-RDP86-00513R000413620002-3"

"Renal changes in multiplex myelomatosis." p. 425 (ACTA MORPHOLOGICA ROADEMIL  
SCIENTIARUM HUNGARICAE, Vol. 2, no. 4, 1952, Budapest, Hungary)

SO: Monthly List of East European Accessions, L.C., Vol. 2 No. 7, July 1953, Uncl.

FRISINGER, F.; BIKALI, M.

Experimental data on etiology of ulcer disease. Acta morph. hung.  
4 no.2:149-159 1954.

1. Institut für Pathologische Anatomie und Experimentelle Krebsfor-  
schung der Medizinischen Universität, Budapest (Vorstad: Prof. J.Balo)  
(PEPTIC ULCER, exper.  
pathogen. in rabbits)

FREISINGER, F.; BIKALI, Magda

A method for experimental production of chronic gastric ulcer. Acta  
morph. hung. 4 no.4:541-544 1954

1. I. Institut für pathologische Anatomie und experimentelle Krebs-  
forschung der Medizinischen Universität, Budapest (Vorstand Prof.  
J.Balo)

(PEPTIC ULCER, exper.  
prod. in rabbits, method)

FREISLER, E.

"Tasks of the Ore Mines in 1953. p. 1.  
(Rudy, Vol.1, No.1, Feb. 1953, Praha.)

SO: Monthly List of East European Accessions, Vol.3, No.3, Library of Congress, March 1954,  
1Uncl.

COUNTRY : GDR H-5  
 CATEGORY : Chemical Technology. Chemical Products and Their  
 Applications--Water treatment. Sewage.  
 AB3. JOUR. : RZKhim., No. 21 1959, No. 75296  
 AUTHOR : Freitag, R.  
 ORG. : Not given  
 TITLE : The Use of Algae in Sewage Treatment  
 ORIG. PUB. : Chem Rundschau, 11, No 13, 357 (1958)  
 ABSTRACT : The intensification of the purification of waste  
 waters in the presence of algae can be traced to  
 the fact that the evolution of oxygen by the  
 plants leads to an intensification of the oxida-  
 tion of organic impurities by bacteria. In turn  
 the products of the decomposition of organic sub-  
 stances (CO<sub>2</sub>, minerals) form a good culture med-  
 ium for the growth of the algae. The wide appli-  
 cation of this sewage treatment process is recom-  
 mended on the basis of USA experience.  
 K. Kandzas  
 CARD: 1/1

CADEK, Josef, inz., Dr.Sc.; FREIWILLIG, Rudolf, inz.; SIF SI SAN, inz., C.Sc.

Equilibrium of iron rich Fe-Cr-Mo-C alloys with carbon concentration of 0,35 per cent at 700°C. Hut listy 17 no.7:507-516  
Jl '62.

1. Vyzkumny ustav hutnictvi zeleza, Praha.

CZECH/34-59-7-14/22

AUTHORS: Mandl, Miroslav, Candidate of Technical Sciences, Ing.,  
Kaše, Miloslav, Freiwillig, Rudolf, Ing., Dostál, Jan

TITLE: Isolation of Non-Metallic Inclusions by the Method of  
Direct Chlorination and their Identification (Isolace  
nekovových vměstků metodou přímé chlorace a jejich  
identifikace)

PERIODICAL: Hutnické Listy, 1959, Nr 7, pp 617-620 (Czechoslovakia)

ABSTRACT: The isolation was effected by the method of direct  
chlorination based on the action of purified chlorine  
on steel or Fe-Si at temperatures of 450 and 800-850°C.  
The identification of the non-metallic inclusions was  
effected by colorimetric methods, except for the Si, for  
which the determination was by gravimetric methods, and  
for calcium, for which the determination was effected  
chelatometrically. A description is given of the  
instrument used and sketches of the apparatus are  
reproduced in Figs 1 and 2. The processes of determina-  
tion of various oxides are detailed in the article.  
There are 9 figures, 1 table and 8 references, 1 of which  
is Czech, 4 English, 2 German, 1 Soviet.

ASSOCIATION: Výzkumný ústav hutnictví železa, Praha (Ferrous  
Card 1/1 Metallurgy Research Institute, Prague) ✓



CADEK, J.; FREIWILLIG, R.; DUPAL, O.

Reaction between carbide and mother metal in some steel alloys. Hut  
listy 16 no.12:874-885 D '61.

1. Vyzkumny ustav hutnictvi zeleza, Praha.

(Steel alloys) (Carbides)

33197

Z/034/62/000/002/001/002  
E073/E535

18.1152 1521 1418 4016

AUTHORS: Čadek, Josef, Engineer, Candidate of Science;  
Čochňář, Zdeněk, Engineer and Freiwilling, Rudolf,  
Engineer

TITLE: Equilibrium conditions of iron-rich Fe-Cr-V-C alloys  
at carbon concentrations of 0.30% and a temperature  
of 700°C

PERIODICAL: Hutnické listy, no. 2, 1962, 122-129

TEXT: In another paper (which is in the process of publica-  
tion in Hutnické listy) the authors and their team emphasize the  
importance of the study of the properties of the individual  
structural components and their mutual reactions from the point  
of view of developing refractory steels and alloys. The subject  
of this paper is the study of the isoconcentration section through  
the isothermic Fe-Cr-V-C tetrahedron for chromium concentrations  
between 0 and 16%, vanadium concentrations between 0 and 5% and  
a carbon concentration of 0.30% at the temperature of 700°C. The  
authors also studied the equilibrium conditions in the iron-rich  
alloys Fe-Cr-Mo-C and Fe-Cr-W-C; however, the results of this work  
will be the subject of separate papers. The iron-rich range of  
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the Fe-Cr-V-C section for 0.20% C and a temperature of 700°C was studied by S.W.K. Shaw and A.G. Quarrell (Ref. 2: J. Inst. 185, 1957, no. 4, 314). Relating to their results it is shown in this paper that doubts exist on whether an equilibrium state was achieved and whether the results of X-ray analysis of the isolated carbide phases were analysed critically enough. The here given results are intended as a contribution to the theoretical bases of the development of pearlite-ferrite, martensite and martensite-ferrite high-temperature steels. The experiments were carried out with 20 mm rods forged from ingots weighing 1.2 kg produced in chill moulds and annealed for four hours at 700°C to improve machinability. The material was produced by smelting in a medium frequency 10 kg furnace, using as charge material the steel ČSN 12013 of the following composition: 0.10% C, 0.29% Mn, 0.02% Si, 0.014% P, 0.023% S, 0.09% Cu, 0.02% Ni, 0.02% Cr. The deoxidation was by silicomanganese followed by aluminium (0.05%), metallic chromium was added after deoxidation and then, after thorough mixing, carbon was added using a synthetic Fe-C alloy of the following composition: 4.38% C, 0.33% Mn, 0.02% Si.

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0.018% P, 0.029% S, 0.13% Cu, 0.03% Ni and 0.11% Cr. Immediately afterwards vanadium was added in the form of ferrovanadium alloy and the melt was teemed. After forging, the rods were air-cooled and then annealed for four hours at 700°C. From these, 14 mm diameter x 32 mm cylinders were produced and sealed into quartz ampoules to prevent decarburization and annealed at 700°C  $\pm$  3°C for a duration of 5000 hours in a chamber furnace. Then the specimens were air-cooled. Prior to isolating the carbides, a layer of 0.7 to 1 mm thick was removed so as to eliminate the influence of possible oxidation. In the tests the carbides were electrolytically isolated and subjected to microchemical analysis and X-ray analysis using CrK $\alpha_{1,2}$  radiation. Furthermore, microstructural analysis and hardness measurements were carried out. Investigation of the kinetics of the reaction of the carbide phase with the basic solid solution in Cr-V steels has shown that, even at 650°C, annealing for 5000 hours is sufficient for achieving an equilibrium state (Ref.17; Z. Čochrný and J. Čadek, Research Report VÚHŽ, being prepared for publication). Therefore, the isoconcentration section through the isothermic Fe-Cr-V-C

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tetrahedron shown in Fig.1 represents the real equilibrium diagram. Direct comparison of the results with those of Shaw and Quarrell is possible only in single instances. As regards the diagram itself, comparison could not be carried out since the diagram of Shaw and Quarrell related to 0.20% C, whilst the here given results relate to 0.30% C. Comparison of the chemical compositions of the individual carbides with those determined by Shaw and Quarrell is problematical since in a number of cases these authors did not achieve the equilibrium state. The view expressed by H. J. Goldschmidt (Ref.8: J.Iron St.Inst.160, 1948, no.4, 345) and V. Foldyna and J. Wozniak (Ref.9: Hutnické listy 15, 1959, no.1 33) that vanadium has a low solubility in the cementite  $M_3C$  was found incorrect; the solubility of vanadium in  $M_3C$  may reach 6 to 7%. In the carbide  $M_{23}C_6$  the solubility of vanadium is considerably higher (up to 13%) than in the carbide  $M_7C_3$  (up to 6.5%). The solubility of chromium and iron in the carbide  $M_4C_3$  is up to 7% and 5.7%, respectively. The results have shown that there is a strong interaction between components of the system Fe-Cr-V-C and therefore laws that are valid for diluted solutions are inapplicable for this

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system even at low concentrations of chromium and vanadium. There are 17 figures, 3 tables and 21 references: 7 Soviet-bloc and 14 non-Soviet-bloc. The English-language references read as follows: Ref.2: quoted in text: Ref.4: E.Smith and J.Nutting, J.Iron St.Inst.187, 1957, no.4, 314; Ref.8: quoted in text; Ref.20: K.H.Jack, J.Iron St.Inst.169, 1951, no.1, 26.

ASSOCIATION: Výzkumný ústav hutnictví železa, Praha  
(Iron and Steel Research Institute, Prague)

SUBMITTED: July 4, 1961

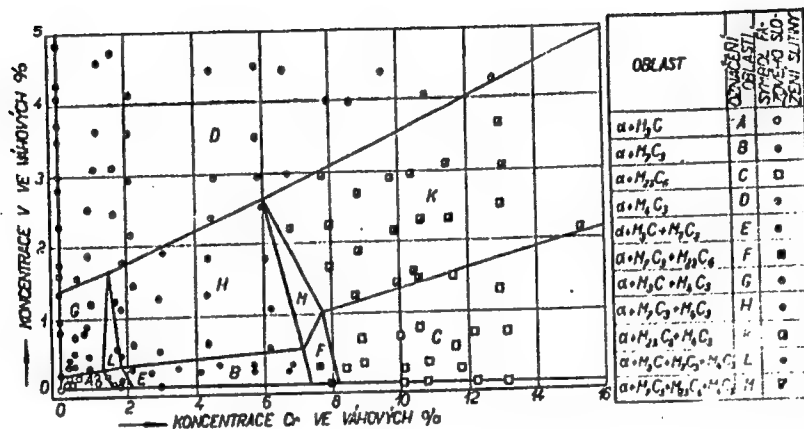
Fig.1. Legend. Isoconcentration (0.30% C) section through the isothermic (700°C) Fe-Cr-V-C tetrahedron.  
Concentration, wt.% vs. Cr concentration, wt.%  
Oblast - phase; označení oblasti - phase designation;  
symbol fázového složení slitiny - symbol used for the phase composition of the alloy.

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Fig. 1



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E073/E335

18.7500

AUTHORS: Cadek, Josef, Engineer and Freiwillich, Rudolf,  
Doctor of Sciences, Engineer

TITLE: States of equilibrium of iron-rich Fe-Cr-W-C alloys  
with a carbon content of 0.20% at 700 °C

PERIODICAL: Hutnické listy, no. 4, 1962, 273 - 282

TEXT: Present knowledge of carbides and intermetallic phases which may be present in the system Fe-Cr-W-C in a stable form is reviewed in the first part of the paper. The latter part of the paper deals with experimental results based on 198 alloys with carbon contents varying between 0.18 and 0.23%. The experimental alloys were subdivided in accordance with their carbon content. The Mn and Si contents were determined for 180 experimental alloys; whilst the P, S, Ni and Cu contents were determined from 48 samples and the Al content was determined for 20 randomly chosen specimens. The composition of these elements was as follows (%):

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E073/E335.

Content, %	Mn	Si	P	S	Cu	Ni	Al
Minimum	0.08	0.02	0.021	0.021	0.14	0.05	0.01
Maximum	0.38	0.34	0.028	0.028	0.17	0.07	0.068
Average	0.18	0.13	0.025	0.024	0.16	0.06	0.02.

The samples were sealed into quartz ampules and annealed for 5 000 hours at  $700 \pm 3$  °C, a time which was ample for achieving an equilibrium state, at least as far as the structure was concerned. The results of phase analyses are plotted in the form of a section of equal concentration (0.20% C) of the isothermal (700 °C) Fe-Cr-W-C tetrahedron in Fig. 1, where the vertical axis gives the tungsten concentration and the horizontal axis gives the chromium concentration, both in wt.%. It can be seen from the diagram that, within the investigated range of concentration there were five two-phase regions, A, B, C, D, E, eight three-phase regions, F, G, H, K, L, M, N, O and four four-phase regions, P, R, S, T.

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The existence of all these regions, except for the four-phase region P, was experimentally proved. Acknowledgments are expressed to Engineer K. Mazanec, Candidate of Sciences, VÚ VZKG, Ostrava, for his comments on the experimental results. There are 20 figures and 4 tables.

ASSOCIATION: Výzkumný ústav hutnictví železa, Praha  
(Iron and Steel Research Institute, Prague)

SUBMITTED: September 14, 1961

Fig. 1 (smaller figure) - Key: 1 - region; 2 - designation of regions; 3 - symbol denoting phase composition of the alloy.

OBLAST	1	2	3
$\alpha$ -Fe	A	1	1
$\delta$ -Fe	B	2	2
$\gamma$ -Fe	C	3	3
$\epsilon$ -Fe	D	4	4
$\zeta$ -Fe	E	5	5
$\eta$ -Fe	F	6	6
$\theta$ -Fe	G	7	7
$\iota$ -Fe	H	8	8
$\kappa$ -Fe	I	9	9
$\lambda$ -Fe	J	10	10
$\mu$ -Fe	K	11	11
$\nu$ -Fe	L	12	12
$\xi$ -Fe	M	13	13
$\omicron$ -Fe	N	14	14
$\pi$ -Fe	O	15	15
$\rho$ -Fe	P	16	16
$\sigma$ -Fe	Q	17	17
$\tau$ -Fe	R	18	18
$\upsilon$ -Fe	S	19	19
$\phi$ -Fe	T	20	20

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Z/034/62/000/007/003/004  
E073/E335

AUTHORS: Čadek, Josef, Doctor of Sciences, Engineer,  
Freiwillig, Rudolf, Engineer and Sie Si San,  
Candidate of Sciences, Engineer

TITLE: Equilibrium states of iron-rich Fe-Cr-Mo-C alloys  
with a carbon concentration of 0.35% at 700 °C

PERIODICAL: Hutnické listy, no. 7, 1962, 507 - 516

TEXT: The isoconcentration section through the isothermal tetrahedron Fe-Cr-Mo-C for Cr contents of 0 - 16% and Mo contents of 0 - 10% was determined by means of electrolytic isolation of carbides which were then subjected to radiographic and micro-chemical analyses. 178 test alloys were used in which the carbon concentration varied between 0.32 and 0.38%, the average being 0.35%. Fig. 1 is the resulting diagram (0.35% C, 700 °C) giving the concentration of Mo in wt.% as a function of the concentration of Cr in wt.%. The letter designation of the areas in the diagram (A - T) as well as the symbols of the phase composition of the alloys are given in Table 4. Table 5 gives the chemical and phase compositions of the alloys for which no

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Equilibrium states of . . . .

Z/034/62/000/007/003/004  
E073/E335

equilibrium state was reached after annealing for 10 000 and even 15 000 hours. The relatively low solubilities of Mo in  $M_7C_3$  cementite (limit concentration not in excess of 1.2%) and of Mo in  $M_{23}C_6$  carbide were confirmed. The maximum concentration of Mo in  $M_{23}C_6$  was 11% and did not reach a value corresponding to the ideal composition of  $Fe_{21}Mo_2C_6$  (composition of the metastable  $M_{23}C_6$  carbide in a ternary Fe-Mo-C alloy). Since Mo lowers the minimum concentration of Cr at which  $M_{23}C_6$  is formed, the Cr concentration in the carbide  $M_{23}C_6$  of this type of alloy can vary within wide limits. Even a very low chromium concentration suppresses, or at least strongly retards, the formation of MC carbide. In the investigated range of Cr and Mo concentrations, the  $\eta$  phase does not exist in a stable form. In earlier investigations of carbide precipitation in Cr-Mo steels at 650 °C and in studies of the structural changes

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Equilibrium states of ....

Z/034/62/000/007/003/004  
E073/E335

in Fe-Cr-Mo-C alloys with 12% Cr and 3% Mo, no precipitation of the  $\eta$  phase was detected in the temperature range 500 - 800 °C. However, the stable existence of  $\chi$  was detected. There are 14 figures and 6 tables.

ASSOCIATION: Výzkumný ústav hutnictví železa, Praha  
(Research Institute for Iron-mining, Prague)

SUBMITTED: August 26, 1961

Table 4.

Key - 1 - Zone  
2 - Zone designation  
3 - Symbol used for the  
phase composition  
of the alloy

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Z/054/62/000/008/002/004  
E073/E535

AUTHORS: Čadek, J., Engineer, Dupal, O. Doctor of Science and  
Freiwilling, R. Engineer

TITLE: Precipitation of carbides in alloy steels.  
Part I. Precipitation of carbides during tempering of  
chromium-molybdenum steels at 650°C

PERIODICAL: Hutnické listy, no.8, 1962, 573-580

TEXT: This and the succeeding parts of the study relate to the precipitation of carbides in chromium-molybdenum, chromium-tungsten and chromium-vanadium steels at 650°C in the case of tempering for periods between 6 min and 5000 hours, as well as for the case of isothermal decomposition of austenite and annealing at the same temperature for periods up to 5000 hours of the products of this decomposition. In this first part the results relating to fifteen chromium-molybdenum steels with compositions as given in Table 1 are reported. The results of studies of the precipitation of the carbide  $M_2C$  and the reaction  $M_2C \rightarrow M_6C$  were the subject of earlier work (Hutnické listy, 16, 1961, no.12, p.374), where the precipitation of the carbides in some of the Card 1/4

Precipitation of carbides ...

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E073/E535

fifteen steels (CM2, CM5, CM9, CM10 and CM12) studied in this paper was also reported. The carbides were isolated electrolytically and then subjected to X-ray diffraction and chemical analyses. The most frequently observed carbides, particularly in the case of high alloyed steels, were  $M_{23}C_6$  and  $M_6C$ . This is attributed to the tendency of chromium and molybdenum to form in Fe-Cr-Mo-C alloys carbides which are characteristic for Fe-Cr-C and Fe-Mo-C alloys, although they are distinguished by a sufficiently high solubility of iron and of the other element (Mo or Cr), but not to form carbides  $M_7C_3$  or MC, which have a low solubility for molybdenum and possibly also for chromium and iron. The carbide  $M_{23}C_6$  may contain only 11.2% Cr and 5.2% Mo and even less or, on the other hand, it may contain up to 11.5% or even more of molybdenum; the chromium concentration in  $M_6C$  may be as high as 9%. Even a very slight addition of chromium into molybdenum steels causes a radical slowing down, or completely suppresses, the formation of MC carbide. In the equilibrium state the solubility of molybdenum in  $M_7C_3$  is only about 2% but in the metastable state it may reach 10%; molybdenum reduces the rate of

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Precipitation of carbides ...

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the reaction  $M_2C \rightarrow M_2C_2$ . At chromium concentrations of up to 1.5-2% the stability of the carbide  $M_2C$  is only slightly affected by the chromium content; however, at higher concentrations chromium reduces the stability of  $M_2C$ . The iron concentration in  $M_2C$  may reach about 10% and in some cases it may reach 27%. The Chromium concentration may reach 22%. The view is widely held that if the solubility of a given element in a given carbide is less than the concentration of this element in the solid solution, the carbide may accept the given element in a concentration not higher than the concentration in the solid solution. It was found that this view is not generally valid, for instance,  $M_2C$  which precipitates during 6 min tempering in the steel CM7 (1.15% Mo and 4.2% Cr) contained 5.3% Mo and 2.6% Cr; the authors could not explain this phenomenon. Neither the precipitation of the intermetallic Laves phase  $Fe_2Mo$  nor the formation of a quaternary carbide could be proved for any of the steels investigated; all the carbides which precipitated and which existed in the stable state were derived from carbides of the appropriate binary or ternary sub-systems. There are 16 figures and 3 tables.

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Precipitation of carbides ...

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ASSOCIATION: Výzkumný ústav hutnictví železa, Praha  
(Iron and Steel Research Institute, Prague)

Table 1

Steel      Composition, %      Ratio\*

	C	Mn	Si	Cr	Mo	$\xi_{Cr}$	$\xi_{Mo}$
CM1	0.37	0.21	0.02	1.35	0.48	0.842	0.162
CM2	0.33	0.26	0.04	1.50	0.92	1.050	0.341
CM3	0.30	0.48	0.02	1.83	1.97	0.965	0.632
CM4	0.38	0.20	0.10	1.65	3.29	1.001	1.083
CM5	0.30	0.21	0.04	1.60	5.70	1.301	2.375
CM6	0.47	0.38	0.42	4.51	0.56	2.215	0.149
CM7	0.42	0.39	0.40	4.22	1.15	2.321	0.331
CM8	0.36	0.34	0.43	4.74	2.13	2.937	0.714
CM9	0.39	0.49	0.30	4.28	3.55	2.532	1.137
CM10	0.41	0.31	0.32	4.25	5.45	2.394	1.662
CM11**)	0.37	0.27	0.25	4.39	6.62	2.740	2.240
CM12**)	0.25	0.28	0.33	4.57	5.77	4.215	2.885
CM13**)	0.60	0.25	0.11	12.56	2.00	4.819	0.417
CM14**)	0.48	0.29	0.31	12.87	3.22	6.182	0.839
CM15**)	0.46	0.39	0.39	13.46	6.26	6.756	1.703

$$* \xi_{Cr} = \frac{\text{at.\% Cr}}{\text{at.\% C}}$$

$$\xi_{Mo} = \frac{\text{at.\% Mo}}{\text{at.\% C}}$$

\*\* Austenization temperature 1250°C

Card 4/4

FREIWILLIG, Rudolf; CADEK, Josef; BRONEC, Josef

Kinetics of decarburization of cold rolled silicon steel transformer sheets in the  $H_2-H_2-H_2O$  and  $CO-CO_2-H_2-H_2-H_2O$  atmospheres. Hut listy 16 no.9:645-651 8 '61.

1. Vyzkumny ustav hutnictvi zeleza, Praha.

Z/034/62/000/009/001/007  
E073/E535

AUTHORS: Čadek, Josef, Engineer, Candidate of Science and  
Freiwillich, Rudolf, Engineer

TITLE: Precipitation of carbides in alloy steels.  
Part II. Precipitation of carbides during tempering of  
chromium-tungsten steels at 650°C

PERIODICAL: Hutnické listy, no.9, 1962, 648-655

TEXT: In Part I of this paper (Hutnické listy, no.8, 1962,  
573-580) the results were described of carbide precipitation  
studies in fifteen chromium-molybdenum steels, tempered at 650°C  
for periods between 6 min and 5000 hours. This second part  
contains results of carbide precipitation studies under the same  
conditions of thirteen chromium-tungsten steels with compositions,  
Table 1, such that these steels can be considered as pure  
quaternary Fe-Cr-W-C steels. Results: The presence of chromium in  
tungsten steels extends the range of W concentration in which  $M_6C$   
may form as a transient phase. This may be due to the widening  
of the range of stable existence of this carbide by chromium. In  
Cr-W steels  $M_6C$  may occur during tempering, either as a stable or  
metastable phase without preliminary deformation of the transient  
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Precipitation of carbides ...

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carbide  $M_2C$ . The presence of W in Cr steels extends considerably the range of concentration in which the carbide  $M_{23}C_6$  can form and exist in a stable manner; the Cr and W concentrations in the carbide  $M_{23}C_6$  may vary within wide limits.  $M_{23}C_6$  and  $M_6C$  are the most frequently observed carbides in Cr-W steels, particularly in high alloyed ones. This is caused by the tendency of the Cr and W to form in Fe-Cr-W-C alloys carbides which are specific to Fe-Cr-C and Fe-W-C alloys but are characterized by a sufficient solubility of the second element (W or Cr) and of iron. However, there is no tendency to form the carbides  $M_7C_3$  and  $MC$ , which have a low solubility for tungsten, chromium and iron. Even a small addition of Cr into W steels leads to a drastic slowing down or complete suppression of formation of the carbide  $MC$ . The solubility of tungsten in  $M_7C_3$  is only about 1.5% in the equilibrium state but in the metastable state the W concentration in  $M_7C_3$  carbides may be much higher, since it can be considerably higher than the W concentration in the solid solution, reaching at least 5.3%. In the  $M_7C_3$  cementite, present in the metastable state, the W and probably also the chromium concentrations may be considerably higher than the equilibrium level with the ferrite of tungsten or chromium steels and,

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Precipitation of carbides ...

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simultaneously, the concentration of these elements in  $M_2C$  may be higher than in the mother solid solution; the causes of this phenomenon cannot be explained. In the initial stages of its existence,  $M_2C$  may contain high concentrations of iron and chromium; the latter hardly increases at all the stability of  $M_2C$  at low concentrations and probably increases slightly at higher concentrations. In Cr-W steels  $M_2C$  is considerably less stable than in Cr-Mo steels. In none of the studied steels could the precipitation of the Laves phase  $Fe_2W$  be proved and this fact is explained by the strong influence of the C content on the minimum W concentration (in the case of a chromium concentration of about 12%) at which this phase can exist. All the carbides that precipitate and exist in a stable manner in the studied steels are derived from carbides of the appropriate binary and possibly ternary sub-systems. Thus, the conclusion of Kuo (J.Iron Steel Inst.185, 1957, no.3, p.297) was confirmed that no quaternary carbide exists in Fe-Cr-W-C alloys. There are 12 figures and 3 tables.

ASSOCIATION: Výzkumný ústav hutnictví železa  
Card 3/4 (Iron and Steel Research Institute)

Precipitation of carbides ...

Z/034/62/000/009/001/007  
EO73/E535

SUBMITTED: September 16, 1961

Table 1

Steel Chemical composition, % Ratio\*

	C	Mn	Si	Cr	W	% Cr	% W
CW1	0.41	0.43	0.09	0.85	0.86	0.48	0.11
CW2	0.40	0.20	0.05	1.62	0.33	0.94	0.09
CW3	0.38	0.38	0.04	1.61	1.17	0.98	0.20
CW4	0.43	0.38	0.05	1.99	2.58	1.02	0.30
CW5	0.42	0.38	0.23	1.70	5.38	0.93	0.84
CW6	0.40	0.32	0.03	1.73	10.29	1.01	1.68
CW7	0.41	0.45	0.13	4.45	1.17	2.52	0.19
CW8	0.43	0.67	0.23	4.28	2.04	2.23	0.38
CW9	0.43	0.39	0.14	4.22	4.87	2.37	0.74
CW10	0.41	0.38	0.14	4.33	9.60	2.44	1.53
CW11	0.81	0.27	0.12	12.46	3.02	5.64	0.39
CW12	0.68	0.37	0.16	12.32	5.30	4.82	0.88
CW13	0.39	0.24	0.07	11.53	9.70	4.51	1.07

$$\% Cr = \frac{\text{at.\% Cr}}{\text{at.\% C}}, \quad \% W = \frac{\text{at.\% W}}{\text{at.\% C}}$$

Card 4/4

FREIWILLIG, R., inz.

"Carbides and intermetallic phases in steels" by L.Brhacek,  
V.Mayer, H.Tuma. Reviewed by R.Freiwillig. Hut listy 19  
no.10:757-758 0 '64.

L 34431-66 I/EWP(t)/ETI IJP(c) JD

ACC NR: AP6026199

SOURCE CODE: CZ/0034/65/000/011/0796/0800

AUTHOR: Freiwillig, Rudolf--Freyvillig, R.; Cadek, Josef--Chadek, I.; Tykal, Kamil <sup>26</sup>

ORG: Research Institute of Ferrous Metallurgy, Prague (Vyzkumny ustav hutnictvi zeleza) <sup>B</sup>

TITLE: Recrystallization of selected grades of Czechoslovak steels. I. Recrystallization diagrams of steels CSN 17021 and CSN 17041

SOURCE: Hutnicke listy, no. 11, 1965, 796-800

TOPIC TAGS: metal recrystallization, steel, cold rolling/CSN 17021 steel, CSN 17041 steel <sup>6</sup>

ABSTRACT: Recrystallization kinetics was investigated in cold rolled CSN 17021 and CSN 17041 steels on specimens with 5-8% reduction in the 650-750°C temperature range and with 30 sec.-2 hrs. annealing times. The results were plotted on thermokinetic diagrams from which the relations of the main parameters of the process annealing can readily be determined, that is, the relations of the annealing temperature and time and the degree of reduction. Suitable combination of those basic parameters makes possible the optimum technique of heat treatment for the grades considered. Orig. art. has: 6 figures and 2 tables. [Based on authors' Eng. abstract]  
[JPRS: 33,732]

SUB CODE: 11, 13 / SUBM DATE: none / SOV REF: 006 / OTH REF: 005

Card 1/1 <sup>118</sup>

UDC: 620.192.4: 669.1.017 <sup>09/6 1747</sup>



LIST, V.

Substitution of ligands in macrocomplexes. Part 3 : Hydrates and  
perhydrates of copper(II)-oxides. Coll Cz Chem 27 no.2:430-438  
F '62.

1. Institut für anorganische Chemie, Karlsuniversität, Prag.

FRET, V.

CZECHOSLOVAKIA

no academic degree indicated

Institute for Inorganic Chemistry, Charles University (Institut für Anorganische Chemie, Karlsuniversitaet), Prague.

Prague, Collection of Czechoslovak Chemical Communications, vol 27, No 10, Oct 62, pp 2450-2453.

"Polarimetric and Spectrophotometric Definition of the Third and Fourth Dissociation Constant of Tartaric Acid."

PIOTR, J.

"Establishing and maintaining sounding stations."

Gazeta Obserwatora. P.I.H.M., Warszawa, Vol 7, No 3, Mar. 1954, p. 6

SO: Eastern European Accessions List, Vol 3, No 10, Oct 1954, Lib. of Congress

L 25181-65

ACCESSION NR: AF5025933

CZ/0017/65/054/005/0234/0240

AUTHOR: Brazda, Miroslav (Engineer); Frejtich, Zdenek (Engineer); Mikulik, Miloslav (Doctor)

TITLE: Programming Method for the Evaluation of Electrical Machines Using Standard Blocks

SOURCE: Elektrotechnicky obzor, Vol 54, Nr 5, 1965, pp 234-240

ABSTRACT: (Authors' Russian and English summaries, modified): The article describes an easy method of setting up evaluation programs for rotary electrical machines using the standard blocks method. The procedure is illustrated on the example of a block design and evaluation of an M-shaped stator slot which is in turn employed in the evaluation program for a double-squirrel cage 6000 V induction motor, and in a simplified manner in the check-out program for the same motor. Orig. art. has: 6 figures.

ASSOCIATION: Vyzkumny a vyvojovy ustav elektrickych stroju krotkych. Pruo (Research and Development Institute of Rotary Electrical Machinery)

SUBMITTED: 10Feb65

NO REF SOV: 001

ENCL: 00

OTHER: 009

SUB CODE: 27, 28  
JPRS

jt

1/1

FREJKA, B.

60th anniversary of Vladimir Novak. Acta chir. orthop. traum cech.  
18 no. 8-9:310-312 1951. (CLML 21:3)

FREJKA, B., Prof., MUDr.

Prognosis in sarcoma of the bones. Acta chir. orthop. traum.  
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1. Z orthoped. kliniky Masarykovy University v Brne, prednosta  
prof. MUDr. B. Frejka.

(SARCOMA,

bones of leg, progn. (Cz))

(BONES, neoplasms,

sarcoma, progn. (Cz))

FREJKA, B.; FAIT, M.

Growth stimulation in a shorter extremity. Acta chir. orthop. traum.  
cech. 25 no.4:268-275 July 58.

1. Ortopedická klinika v Brně. B. F., Masova 10, Brno  
(LEG, abnormalities,  
length inequality, growth stimulation (Cz))  
(GROWTH,  
stimulation in leg length inequality (Cz))

КРАМАРЕНКО, Г.Н.

КРАМАРЕНКО, Г.Н., kand.med.nauk; НЕЧАЙНОВА, З.П.; ТКАЧЕНКО, С.С.; ОСНА, А.И., dotsent; КУРИЛО, А.А.; МЕЗЖНИНА, Ye.P., kand.med.nauk; КРЫУК, А.С., kand.med.nauk; ПАРЫКА, Б., prof.

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(ORTHOPEDIC SOCIETIES)



FREYKA, B. [Frejka, B.], prof. (Brno, Czechoslovakia)

Prevention of congenital hip dislocations. Ortop.travm. i protet. 20  
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(HIP, dislocations,  
congen., prev. (Rus))

REMIKA, B.

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(HIP, fract. & disloc.)

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Measurement of anterior torsion of the femur. Description of the method used at the orthopedic clinic in Brno. Acta chir. orthop. traum. ceoh. 26 no.5-6:400-408 Nov 59.

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(HIP, fract. & disloc.)

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(HIP, fract. & disloc.)

FREJKA, B.; KOSINKA, E.

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FREJKA, B.

Development of the tegmen in congenital dislocation of the hip.  
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(HIP fract.disloc.)

FREJKA, B.

70th anniversary of Prof. Vladimir Novak, MD. Acta chir.orthop.traum.  
cech. 28 no.5:389-392 0 '61.

(BIOGRAPHIES)

FREJKA, B.

The origin and prevention of scoliosis. Acta chir. orthop. trauma.  
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1. Ortopedická klinika University J. Ev. Purkyně v Brně, predn. prof.  
MUDr. B. Frejka, Dr. Sc.

(SCOLIOSIS)



FRELJKA, B.

Necrosis of the head of femur following traumatic dislocation.  
Acta chir. orthop. traum. czech. 29 no.2:117-118 '62.  
(FEMUR HEAD fract & disloc)

FREJKA, B.

Stiffness of the shoulder joint. Acta chir. orthop. traum.  
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1. Ortopedická klinika lékařské fakulty University J.E.  
Purkyne v Brně (prednosta: prof. dr. M. Janeczek, CSc.).

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Apparatus for catalytic hydrogenation. J. Puzyna. *Collection Czechoslovak Chem Communications* 2, No. 8-9, 431 9(1967). An inexpensive and portable app is described for measuring H<sub>2</sub> and delivering it at const pressure. It displays most of the water in a 2 l. calibrated glass cylinder, the overflow collecting in a reservoir attached to a pump. One end of an inverted U tube is inserted in the line supplying the water to the cylinder. The other end is connected with a column of Hg sufficient for the desired pressure. As H<sub>2</sub> is delivered to the reaction chamber more water is pumped into the cylinder. When working under reduced pressures water is drawn into the cylinder by releasing the intervening clamp.

ANN NICHOLSON Hfmu

Some combinations of cobalt and nickel salts with 2,3-diaminobutane. J. FRYKA AND (Mlle) L. ZAHLOVA Collection Czechoslov. Chem. Comm. 2, No. 10, 639-51 (1934) (in French).—The authors have prepared derivs. of Co and Ni and diaminobutane contg. the SO, Cl, Br, I, NO, CN and CNS radicals. The diaminobutane for the experiments was obtained by the authors' method of the catalytic reduction of dimethylglyoxime (C. A. 28, 3762). It has been established that the behavior of 2,3-diaminobutane with respect to the salts of Co and Ni is similar to that of ethylenediamine and propylenediamine. In the prepn. of the sulfates, which previous authors have used as the starting points for other compds., certain difficulties were encountered since, by the direct action of NISO<sub>4</sub> and diaminobutane ( $=bn$ ) even in the presence of excess of the amine only the sulfate [Ni(bn)<sub>2</sub>H<sub>2</sub>O]SO<sub>4</sub>·2H<sub>2</sub>O was obtained, whereas other Ni salts under the same conditions gave only salts of the type [Ni(bn)<sub>x</sub>A]<sub>y</sub>H<sub>2</sub>O and never salts less rich in bn. The authors did not succeed in the prepn. of compds. of the type [Ni(bn)<sub>x</sub>A]<sub>y</sub>H<sub>2</sub>O. The Ni salts reported are ( $s = mol.$ ,  $ss = very sol.$ ,  $sl = slightly sol.$ ,  $insol.$ ). [Ni(bn)<sub>2</sub>·2H<sub>2</sub>O]SO<sub>4</sub>·2H<sub>2</sub>O, fine, blue-violet crystals,  $ss$ ; [Ni(bn)<sub>2</sub>(Cl)<sub>2</sub>·H<sub>2</sub>O], red-violet crystals,  $ss$ ; [Ni(bn)<sub>2</sub>(Br)<sub>2</sub>·H<sub>2</sub>O], red-violet crystals,  $s$ , less than Cl compd.; [Ni(bn)<sub>2</sub>(I)<sub>2</sub>·H<sub>2</sub>O], red violet needles,  $ss$ ; [Ni(bn)<sub>2</sub>(NO)<sub>2</sub>·H<sub>2</sub>O], red-violet crystals,  $ss$ ; [Ni(bn)<sub>2</sub>(CNS)<sub>2</sub>·H<sub>2</sub>O], red violet needles,  $ss$ ; [Ni(bn)<sub>2</sub>(CNS)<sub>2</sub>·H<sub>2</sub>O], violet needles, soly, not given, and [Ni(bn)<sub>2</sub>(CN)<sub>2</sub>], rose crystals,  $ss$ . The Co salts reported are [Co(bn)<sub>2</sub>]Br<sub>2</sub>, small orange red crystals, soly, not given; the corresponding Cl compd. did not crystallize; [Co(bn)<sub>2</sub>]·2H<sub>2</sub>O, yellow-brown powder,  $ss$ , and [Co(bn)<sub>2</sub>(CNS)<sub>2</sub>·6H<sub>2</sub>O], orange-yellow powder,  $ss$  cold,  $s$  hot water. Details of the prepn. and analyses of these compds. are given. EDWARD B. SANIGAR

EDWARD B. SANIGAN

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**Tetranitropyrrocatechol and some of its derivatives.** J. FRIEKE, J. ZIEKA AND H. HAMBRACK. *Collection Czechoslov. Chem. Comm.* 3, 550-560(1931) —When 4.6 cc of anhyd. AcOH is added in the course of 10 min. to a concd. soln. of 1 g. of pure  $\alpha$ - $C_6H_4(OH)_2$  in 5 g.  $H_2O$  and 5 g.  $NaNO_2$  in 8 g.  $H_2O$ , while the mixt. is cooled in ice and shaken vigorously, the product is a red salt,  $C_6(NO)_2(OH)_2ONa$  (I) (80% yield). I is also obtained by adding an excess of  $EtONa$  to  $C_6(NO)_2(OH)_2$  (II). When dry it explodes upon shock. Heated slowly, it explodes at 91°; heated very carefully, it loses N at 80° and does not explode at a higher temp. With alkalis it gives a blood-red soln. from which acids set free II. II was prepd. by mixing I with  $H_2O$  and adding the calcd. quantity of HCl or  $H_2SO_4$ . When dry it explodes upon a slight shock. Heated with concd.  $HNO_3$  it decomps. often explosively. It is a rather strong acid and decomps. nitrates, carbonates and acetates. II is sol. in alkalis with a blood-red color; in  $H_2SO_4$  with a yellow-red color. It could not be analyzed because it decomps. so readily. Other salts of II were prepd. either from I or from II. The Pb salt is normal, all the others are acid salts. *NH\_4* salt, yellow-brown, sol. in alkalis with a blood-red color; *Ag* salt, yellow-red, most explosive of all the salts prepd.; *Cu* salt, dull brown; *Pb* salt, deep red-brown, explosive when dry; *Cd* salt, brown; *Ca* salt, dark brown; *Ba* salt, brownish red. Both I and II dye wool mordanted with Fe or Cr brown; unmordanted wool is dyed yellow shading to brown. *Diarsite* of II, yellow, very explosive when dry, but less so than the salts. When heated slowly N is evolved, and the residue burns without explosion. It is sol. in alkalis with a blood-red color, saponified by alkalis and by hot concd. HCl. *Dibenzate* of II, yellow, sol. in alkalis with a blood-red color and saponified by them. *HCl* salt (III) of  $C_6(NH_2)_4(OH)_2$  (IV) is obtained by reducing II with Sn and HCl. Its aq. soln. reduces Fehling soln. and  $AgNO_3$ . IV is evidently very unstable for it could not be isolated. III gives unstable colored ppts. with several inorg. salts. Addn. of  $H_2SO_4$  to a concd. soln. of III converts it into  $C_6(NH_2)_4(OH)_2 \cdot 2H_2SO_4$ , which is more stable than III. *HBr* salt of IV, brown; *picrate*, yellow, explosive.

LOUISE KELLEY

ASAC-SEA METALLURGICAL LITERATURE CLASSIFICATION

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COMMON ELEMENTS

PROCESSES AND PREPARATIONS

**Action of nitrous acid on pyrocatechol-4-sulfonic acid**  
 J. Freyha and J. Zika. *Collection Czechoslov. Chem. Communications* 9, No. 6, 253 (1964) (in French), cf. C. A. 26, 1913. The starting point of the work was the Na or K salt of pyrocatechol-4-sulfonic acid (I), prepd. by heating pyrocatechol with concd.  $H_2SO_4$ , neutralizing the mixt. with  $BaCO_3$  and treating the recrystd. Ba salt of I with the calcd. amt. of Na or K sulfate. Excess  $HNO_3$  (from dil.  $H_2SO_4$  or  $HCl + NaNO_2$ ) reacted with the Na salt of I, to give the Na deriv. of the di-NO deriv. of I; less acid permitted the mono-NO deriv. to be obtained also. Despite repeated attempts, the di-NO deriv. could not be prepd. The free di-NO deriv. was obtained by the action of concd.  $HCl$  on the Na or K deriv. The following derivs. of the di-NO compd. are described: Na and K derivs., yellow-brown needles; free acid, golden yellow needles, explosive; Ba deriv., small, golden yellow needles, very explosive; Sr deriv., similar to Ba deriv.; Ca deriv., golden yellow lamellas; Ag deriv., very explosive needles. The above derivs. are mostly only slightly sol. in warm  $H_2O$  and org. solvents. Reduction of the free di-NO compd. (with Sn and  $HCl$ ) gave the  $HCl$  salt of the corresponding diamine (white needles, very sol. in  $H_2O$ ). Oxidation of the strongly reducing diamine (by air or  $FeCl_3$ ) yielded a light green ppt. of the corresponding quinone (nearly insol. in  $H_2O$  and org. solvents). The picrate (golden yellow needles, unstable in air) and the Ac deriv. (fine, white crystals, very slightly sol. in  $H_2O$  and org. solvents) of the diamine acid were also prepd.

Edward B. Saniger

ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION

Halogen derivatives of procaine II (p-bromo-o-amino-benzoyldiethylaminoethanol). J. Fricke and F. Vymetal. Collection. Czechoslov. Chem. Communications 7, 416-43 (1935); cf. C. A. 19, 2332. In order to study further the effect of halogens in the ring of procaine on the physiological properties of the compds. it was decided to invert the positions of the Br and NH<sub>2</sub> in bromopropamine to obtain 4-bromo-2-aminobenzoyldiethylaminoethanol. This was found to be an oil that gave a *M*<sub>2</sub><sup>+</sup> salt, m. 160°. Both caused an intense anesthesia of the tongue. The HCl salt was prep'd. (17% yield) by heating 1 g. 4-bromo-2-aminobenzoyldiethylaminoethanol (I), m. 80-1°, and 0.6 g. NH<sub>4</sub>Br, in a sealed tube at 110° for 10 hrs. The contents of the tube were ext'd. with aq. Et<sub>2</sub>O, this soln. was ext'd. with the calcd. amt. of aq. HCl, the aq. soln. was treated with the calcd. amt. of K<sub>2</sub>CO<sub>3</sub> and ext'd. with Et<sub>2</sub>O, and finally the Et<sub>2</sub>O soln. was ppt'd. with HCl in EtOH. I was prep'd. (21%) by heating 1 g. of 4-bromo-2-aminobenzoyldiethylaminoethanol (II), m. 222°, and 0.7 g. CH<sub>2</sub>ClCH<sub>2</sub>OH in benzene acid (III), m. 222°, and 0.7 g. CH<sub>2</sub>ClCH<sub>2</sub>OH in benzene acid (III), m. 222°, for 6 hrs. on a water bath. Considerable difficulty was experienced in finding an efficient method of prep'g. II. Three methods were tried: (1) NaNO<sub>2</sub> (9 g.) in 50 cc. conc'd. H<sub>2</sub>SO<sub>4</sub> was added to 20 g. 4-BrC<sub>6</sub>H<sub>4</sub>NH<sub>2</sub> in H<sub>2</sub>SO<sub>4</sub> to give 80% 3-nitro-4-bromo-

acetanilide, m. 103-4°. This was sapon'd. with 50% H<sub>2</sub>SO<sub>4</sub> to give 83% 3-nitro-4-bromobenzoic acid, m. 112°. This was very difficult to distillize and gave only 12-15% of 3-nitro-4-bromobenzonitrile, m. 94-5°, which was hydrolyzed by 50% H<sub>2</sub>SO<sub>4</sub> to give 75% of 3-nitro-4-bromobenzoic acid (III), m. 163-4°. This was reduced by Fe and HCl to give 70% of II. (2) When 2-O<sub>2</sub>NC<sub>6</sub>H<sub>4</sub>Me was brominated, using Fe, a mixt. of isomers were formed from which 15% 3-nitro-4-bromobenzene (IV), m. 43°, was isolated. It was almost impossible to oxidize IV to III. The only practical method, heating it in a sealed tube at 150-70° for 10 hrs. with 30% HNO<sub>3</sub>, gave only 48%. (3) However, reduction of IV with Fe and HCl and steam distn. gave 30% 3-aminobenzene, an oil; acetate, m. 165°. One g. of this acetate in 100 cc. H<sub>2</sub>O contg. 10% NaOH was easily oxidized by KMnO<sub>4</sub> in 6 hrs. to give 50% 2-acetyl-3-aminobenzoyldiethylaminoethanol, m. 200° (220°), which was hydrolyzed by 50% H<sub>2</sub>SO<sub>4</sub> to give 80% II. J. R. M.

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**Bromo derivatives of pyrocatechol.** J. Krejka and B. Sefranek. *Collection Czechoslov. Chem. Communications* 2, 129 (1967). A detailed study of the previously prepared methods for the prepn. of Br derivs. of pyrocatechol (I) has shown that it is relatively easy to prep. the tetra- and tri-Br derivs. less easy to make di-Br compds. and impossible to produce the mono-derivs. directly. The direct bromination of 4.4 g. I in 45 cc.  $\text{CHCl}_3$  with 21 g. Br in 20 cc.  $\text{CHCl}_3$  in the cold gave yellow crystals of  $\text{C}_6\text{H}_2\text{Br}_4$ , m. 191-2°. di-Ac deriv., m. 215-16°. Bromination in the presence of concd.  $\text{H}_2\text{SO}_4$  invariably yielded the tetra-Br deriv. in pure white crystals but mediocre yields. Modification of Ger. pat. 207,544 and 215,357 by carrying out the bromination in 3%  $\text{CHCl}_3$  solns. of I gave an a-thydis product, cryst. from benzene in white needles of 3,4,5-tribromopyrocatechol (III), m. 143-4°; di-Ac

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deriv., m. 110-20°. It was characterized by refluxing 5 g. with 20 cc. MeOH contg. 10 g. MeI and 5 g.  $\text{K}_2\text{CO}_3$  for 2 hrs. The reaction product was distd. with  $\text{H}_2\text{O}$ . The insol. residue was recrystd. from dil. alc. and yielded  $\text{C}_6\text{H}_2(\text{OMe})_2\text{Br}_2$ , m. 80°. Of the 4 possible dibromopyrocatechols, the structures of the 1,5- and 1,6-di-Br derivs., m. 92-3° and 86-90°, have been definitely established. The introduction of 2 mols. of various Br into a  $\text{C}_6\text{H}_4$  soln. contg. 3.3 g. I by means of a current of 200 at. room temp. gave white crystals which were recrystd. from hot benzene and dried *in vacuo* for several days, yielding 80% of 3,4-dibromopyrocatechol (II), m. 71-4°. di-Ac deriv., m. 95-6°. The bromination of 2 g. III in 80 cc.  $\text{CHCl}_3$  with 0.4 cc. Br in 20 cc.  $\text{CHCl}_3$  produced II. Repetition of the work of Kohn and Pfeiffer (C. A. 21, 3645) by reducing the tetra-Br deriv. by Zn in  $\text{Ac}_2\text{O}$  and AcOH gave a di-Ac deriv., m. 108-70°, hydrolyzed by dissolving in  $\text{H}_2\text{SO}_4$  and pptn. with  $\text{H}_2\text{O}$  to a yellow product, m. 118-20°, which has not been obtained pure but which may be identical with the dibromopyrocatechol of the Schering patent, Ger. 207,544, and which may be the remaining isomeric 3,6-dibromopyrocatechol, m. 120°; di-Ac deriv., m. about 170°. C. R. Aldmall



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 New method of preparing some halogenated derivatives of dihydroxydi-o-phenylene dioxide. J. Firjka, B. Seifanek and J. Zikla. *Collection Czechoslov. Chem. Commun.* 9, 234-40 (1937) (in French); cf. C. A. 28, 127<sup>6</sup>, 4397<sup>6</sup>.--Tetrachloropyrocatechol (5 g.), prepd. according to the method of Zincke (*Ber.* 20, 1779), in 10 cc. AcOH treated slowly with 1.0 g. NaNO<sub>2</sub> in 8 cc. H<sub>2</sub>O gives 2 g. hexachloro-o-quinone-hemipyrocatechol ether, red needles purified with hot EtOH, m. 285.5°; the compd. oxidizes readily in air and because of its instability must be reduced immediately; reduction with either Sn and HCl or SO<sub>2</sub> in EtOH gives 1,4,5,6,7,8-hexachloro-2,3-dihydroxyphenylene dioxide, needles from EtOH, m. 276° (decompn.), which gives an intense green color with FeCl<sub>3</sub> in EtOH, and, because of its instability, must be immedi-

ately converted to its corresponding di-Ac deriv., crystals from CCl<sub>4</sub>, m. 301° (cor.). 4,5-Dichloropyrocatechol (1 g.), prepd. according to the method of Peratoner (*Gazz. chim. ital.* 28, 1, 222), in H<sub>2</sub>O treated with 0.5 g. NaNO<sub>2</sub>, and 20 cc. 25% AcOH gives 6,7-dichloro-o-quinone-hemipyrocatechol ether, which reduces with Sn and HCl or SO<sub>2</sub> in EtOH to 6,7-dichloro-2,3-dihydroxydi-o-phenylene dioxide; di-Ac deriv., m. 218°. Tetrabromopyrocatechol (5 g.), prepd. according to method of P. and S. (C. A. 30, 4474<sup>6</sup>), in 13 cc. AcOH treated with 5 g. NaNO<sub>2</sub> in 15 cc. H<sub>2</sub>O added dropwise gives 2 g. of hexabromo-o-quinone-hemipyrocatechol ether, red crystals, m. above 300° (decompn.), which is unstable; reduction of the quinone (2 g.) in 20 cc. boiling EtOH with dry Sn for 2 hrs. gives 0.6 g. (30% yield) of 1,4,5,6,7,8-hexabromo-2,3-dihydroxyphenylene dioxide, which with Ac<sub>2</sub>O gives 0.3 g. (47% yield) of the di-Ac deriv., m. above 300° (decompn.). Treating 27.5 g. pyrocatechol in 40 cc. EtOH with 18.5 cc. SO<sub>2</sub>Cl<sub>2</sub> in an atm. of CO<sub>2</sub>, followed by addn. of 100 cc. petroleum ether with the exclusion of moisture, gives 12 g. 4-chloropyrocatechol, m. 88°. Treating the latter compd. (1 g.) with 100 cc. 5% NaNO<sub>2</sub> soln. in (a) aq. medium followed by adding 0.45 cc. Ac<sub>2</sub>O or (b) Ac<sub>2</sub>O medium gives 0.7 g. 4-(4-chloro-2-hydroxyphenoxy)-1,2-benzoquinone which reduces with SO<sub>2</sub> in 25 times its wt. of EtOH after 2 hrs. to give 0.3 g. 4-(4-chloro-2-hydroxyphenoxy)-1,2-dihydroxybenzene, which with Ac<sub>2</sub>O forms the corresponding tri-Ac deriv., crystals from EtOH, m. 178°.

John F. Lantz

Preparation of 3,6-dibromo- and 3,4,6-tribromopyrocatechol. J. Fritka and B. Kefánek. *Collection Czech. Chem. Commun.* 11, 105-70(1930)(in French); *Pub. faculté sci. univ. Masaryk No. 269, 3 7(1930)*; cf. C. A. 30, 4474<sup>o</sup>.—It is shown that the dibromopyrocatechol, m. 122<sup>o</sup> (diacetate, m. 100<sup>o</sup>), which was obtained by Skoof (C. A. 30, 3164<sup>o</sup>) by brominating acetonepyrocatechol and among the resulting di-Br deriv., is not 3,5-dibromopyrocatechol (m. 92-3<sup>o</sup>; diacetate, m. 110<sup>o</sup>) as assumed by him but 3,6-dibromopyrocatechol (I), the only isomeric dibromopyrocatechol missing. The further bromination of I in CHCl<sub>3</sub> yielded a tribromopyrocatechol (II), m. 135.6<sup>o</sup> (diacetate, m. 115<sup>o</sup>), different from 3,4,6-tribromopyrocatechol (m. 143.4<sup>o</sup>). Therefore, II must be 3,4,6-tribromopyrocatechol. It is assumed that the tribromopyrocatechol, m. 138<sup>o</sup>, contg. 1 mol. H<sub>2</sub>O of crystn., described in the German patents 297,544 and 215,337 (C. A. 3, 2035; 4, 644) is a mixt. of 3,4,5- and 3,4,6-tri-Br derivs. Dora Stern

1ST AND 2ND ORDERS																										3RD AND 4TH ORDERS																									
PROCESSES AND PROPERTIES INDEX																																																			
<p>2</p> <p>The recipients of the Nobel prize in chemistry. J. Erika. Chem. Listy 83, 175-81 (1938).--In a review P. summarizes the contributions of Haworth to carbohydrate chemistry and of Karrer in pharmacosynthesis. Frank March</p>																																																			
<p>ASH-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>																																																			
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4

Chemistry of dehydroabiatic and 6-sulfodehydroabiatic acids and some of their salts. J. Prejka and A. Zenisek (Charles Univ., Prague). *Chem. Zvesti* 44, 3-10(1950).  
6-Sulfodehydroabiatic acid was isolated as its Na or Ba salt from the sulfonation products of colophony. The Ba, Sr, Be, Pb, and Zn primary (acid) salts were prepd. Attempts to convert the CO<sub>2</sub>H to an NH<sub>2</sub> group were unsuccessful. M. Hudlický

FREJKA, J.; ZAMIS, H.

Synthesis on the nucleus of halogenated ephedrine. Cas.cesk.lek.  
Ved.prihola 63 no.9-12:157-158 Dec 1950. (CML 20:9)

CA

*Procaine derivatives*  
*Procaine*

Chemistry of procaines containing halogen in the nucleus. J. Fajka and J. Pírk (Univ. Prague). *Czechoslov. farm.* 1, 300-10(1952).—Some new procaines containing halogen in the nucleus were prepd. by 2 different methods: (1) by heating of corresponding *p*-aminobenzoic acids containing halogen (I) with diethylaminoethanol in a sealed tube, (2) by transesterification of ethyl esters of I with diethylaminoethanol by catalysis with Al isopropylate. The second method produced better results. A method for the prepn. of the new compd., diethylaminoethyl 3,5-dichloro-4-aminobenzoate, and a new method of prepn. of diethylaminoethyl 3-iodo-4-aminobenzoate by reesterification of ethyl 3-iodo-4-aminobenzoate with diethylaminoethanol were described.

Dagmar Hubíková

FREJKA, JOSEF

CZECHOSLOVAKIA/Chemical Technology - Chemical Products and Their Application. Industrial Organic Synthesis. H-15

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 26044

Author : Ciernik Jan, Frejka Josef

Inst : -

Title : Preparation of N-Vinyl Phthalimide by Pyrolysis of Esters of Beta-Phthalimidoethanol.

Orig Pub : Chem. prumysl, 1957, 7, No 6, 326-328

Abstract : Pyrolysis was conducted in a quartz tube filled with porcelain Raschig rings. A study was made of the yield of N-vinyl phthalimide (I) depending on temperature and rate of feed of reactant. Optimal condition of pyrolysis of beta-phthalimido-ethyl acetate: temperature 550-600°, rate of feed  $6.9 \cdot 10^{-3}$  g/cc per minute, degree of conversion 100%, yield of I 94%. It is recommended to conduct pyrolysis of a solution of the acetate in glacial  $\text{CH}_3\text{COOH}$ .

Card 1/2

Frejka, Josef  
CZECHOSLOVAKIA/Chemistry of High Molecular Substances.

I

Abs Jour: Referat. Zhurnal Khimiya, No 10, 1958, 34963.

Author : Jan Čiernik, Ludvik Ambrož, Josef Frejka.

Inst : Not given.

Title : Polymerization of N-vinylphthalimide.

Orig Pub: Chem. průmysl, 1957, 7, No 9, 509-511.

Abstract: The polymerization of N-vinylphthalimide in ethyl acetone and acetate was studied and the effects of the temperature, the monomer concentration and the initiator (benzoyl peroxide) on the reaction rate were determined. The initiation is produced not only by peroxide radicals, but also thermally. The general polymerization rate  $V$ , the initiator concentration  $I$  and the monomer concentration  $M$  are con-

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CZECHOSLOVAKIA / Organic Chemistry. Synthetic Organic Chemistry. G-2

Abs Jour: Ref Zhur-Khimiya, No 23, 1958, 77712.

Author : Frejka, J. and Wiesner, I.

Inst : Not given.

Title : Reactions of Tetraalkoxysilanes with n-Bromobutanol.

Orig Pub: Chem Listy, 51, No 12, 2369-2371 (1957) (in Czech).

Abstract: The yields and composition of the products obtained from the reaction of tetraethoxysilane (I) with  $C_4H_9Br$  [sic] at 200-500° have been investigated. It has been found that the reaction mixture contains  $(C_2H_5O)_3SiOC_4H_9$ ,  $(C_2H_5O)_2Si(OC_4H_9)_2$ ,  $C_2H_5OSi(OC_4H_9)_3$ , and I. The pyrolysis of I in the same temperature range yields ether [sic] (0.5-3%). Similar reactions are observed with tetramethoxysilane and triethoxypropanoxysilane. -- J. Kovar.

Card 1/1

CZECHOSLOVAKIA / Organic Chemistry--Synthetic organic chemistry. G-2

Abs Jour : Ref Zhur - Khimiya, No 14, 1959, No. 49578

Author : Frajka, J.; Wiesner, I.

Inst : Not given

Title : The Reaction of Tetraalkoxysilanes with n-Butylbromide

Orig Pub : Collection Czechoslov Chem Commun, 23, No 10, 1984-1987  
(1958)

Abstract : Soo RZhKhim, No 23, 1958, 77712

Card 1/1

G-20

CZECHOSLOVAKIA/Organic Chemistry. Synthetic Organic Chemistry. G-2

Abs Jour: Ref Zhur-Khim., No 24, 1958, 81704.

Author : Kratochvil M , Frejka J.

Inst

Title : The Reaction Between Silicon Tetrachloride With  
Tetrahydrofuran.

Orig Pub: Chem. listy, 1958, 52, No 1, 151-152.

Abstract: By the reaction of  $\text{SiCl}_4$  with tetrahydrofuran (I) in the presence of catalytic amount of concentrated HCl, tetra[kis-]\*(4-chlorobutoxy)-silane (II) is formed, together with 1-chlorobutanol-4, and a mixture of chlorobutoxy silanes. After boiling 1.25 moles of I with 0.25 moles of  $\text{SiCl}_4$  and 1 ml of concentrated HCl for 6 hours, an additional 0.5 moles of I is added to the mixture with intensive cooling.

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\*[sic]

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CZECHOSLOVAKIA/Organic Chemistry. Synthetic Organic Chemistry. G-2

Abs Jour: Ref Zhur-Khim., No 24, 1958, 81639

Author : Kratochvil M., Frejka J

Inst :

Title : The Preparation of the Acid Chloride, 3-Chlorotetrahydrofurfuryl Acetic Acid

Orig Pub: Chem. listy, 1958, 52, No 1, 152-153.

Abstract: The acid chloride (II) of 3-chlorotetrahydrofurfuryl acetic acid (IIa) was obtained by the reaction of 2,3-dichlorotetrahydrofuran (I) with ketone in the presence of 0.1% anhydrous  $ZnCl_2$ . The catalyst in the amount of  $> 5\%$  leads to the polymerization of I. Once more 0.5 moles of I is passed through the reaction column with the addition of 0.01 grams of calcined  $ZnCl_2$  dissolved in 20 ml ether at  $30^\circ C$  and

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11. FREJKA, L.  
CA

The bromo derivatives of procaine. III. 1. Frejka and L. Cizmár. *Chem. Listy* 31, 460-4 (1947). Cryst. novocaine (procaine) (2.7 g. in a min. vol. of H<sub>2</sub>O) was stirred in a turbine, illuminated by sunlight, and treated with 1.0 g. of Br in ether. Immediately after the addn., for the reaction was instantaneous, water was added to absorb the Br deriv. The ag. layer was sep., covered with fresh ether, neutralized with Na<sub>2</sub>CO<sub>3</sub>, and shaken with more ether. After the ether layer sep. from the water, it was dried with CaCl<sub>2</sub>, filtered, and neutralized with HCl in abs. EtOH. The product, C<sub>11</sub>H<sub>14</sub>O<sub>4</sub>N<sub>2</sub>BrCl<sub>2</sub>H<sub>2</sub>O (I) re-crystd. from ether-EtOH m. 157-8°. The same deriv. was prepd. synthetically: *m*-bromo-*p*-acetanilide was oxidized with KMnO<sub>4</sub> in the presence of MgSO<sub>4</sub> to form 3,4-Br(AcNH)C<sub>6</sub>H<sub>3</sub>CO<sub>2</sub>H which when digested with H<sub>2</sub>SO<sub>4</sub> left 3,4-Br(H<sub>2</sub>N)C<sub>6</sub>H<sub>3</sub>CO<sub>2</sub>H. The latter, when esterified with C<sub>2</sub>H<sub>5</sub>Cl, and treated with Et<sub>3</sub>NH, yielded I. Therefore, I represents a *m*-deriv. Similarly the 3-bromo anesthetic and 3-bromoproparsine deriva. were prepd. by the esterification of 3,4-Br(H<sub>2</sub>N)C<sub>6</sub>H<sub>3</sub>CO<sub>2</sub>H with EtOH or PrOH, resp., in the presence of H<sub>2</sub>SO<sub>4</sub>.

Frank Marsh

ASSOCIATE METALLURGICAL LITERATURE CLASSIFICATION

FREJKA, B.; PAIT, M.; LITZMAN, O.; FREJKOVA, M.

Measurement of anterior torsion of the femur. Description of the method used at the orthopedic clinic in Brno. Acta chir. orthop. traum. cech. 26 no.5-6:400-408 Nov 59.

1. Ortopedická klinika university v Brne, prednosta prof. dr. lek. ved. B. Frejka.

(HIP, fract. & disloc.)

L. FRELKOVA-LITZMANOVA

"A contribution to studies of the morphology of the Cretaceous area in the environs of Brezova nad Svitavou."

p.383 (Casopis Pro Mineralogii A Geologii, Vol. 2, no. 4, 1957, Praha; Czechoslovakia)

Monthly Index of East European Accessions (EEAI) LC, Vol. 7, No. 8, August 1958

FREJLICH K., HORNOWSKI M.

Algebra by K. Frejlich, and M. Hornowski. Reported in New Books  
(Nowe Ksiaski), No. 7, April 1, 1956.



**"APPROVED FOR RELEASE: 06/13/2000**

**CIA-RDP86-00513R000413620002-3**

**APPROVED FOR RELEASE: 06/13/2000**

**CIA-RDP86-00513R000413620002-3"**

RYTEL, Eugeniusz, inz.; FREJUS, Waldemar, inz.

Tower cranes. Przegl mach 23 no.9/10:261-263 25 My '64.

1. Head, Department of Cranes and Lifting Equipment, Central Building Equipment Designing Office, Warsaw (for Rytel). 2. Senior constructor, Central Building Equipment Designing Office, Warsaw.

FREJVALD, Milos; JAKES, Petr

Report on the structural relation of the Tabor syenite and the Moldanubikum. Cas min geol 9 no. 1 93-94 '64.

1. Geologicky ustav, Ceskoslovenska akademie ved.

FAJST, Miroslav; FRELVALD, Milos

Vir - Bystřice dislocation on the southeast border of the Svratka  
Anticlinal. Cas min geol 9 no. 1:99-102 '64.

1. Přírodovědecká fakulta Karlovy university; Geologický ústav,  
Československá akademie věd.